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ABSTRACT

A study identified the appropriate general content, structure, and sequence for a detailing discipline that promoted student achievement to professional levels. Its focus was the detailing discipline, a sequence of studio courses within the furniture design program at Kendall College of Art and Design, Grand Rapids, Michigan. (Detailing, an applied form of drafting, is the name of the graphic technical language used to communicate information about furniture.) Knowledge of Kendall's history, the furniture design program emphasis, and the industry-specific nature of detailing were studied to identify problems concerning detailing and possible solutions. A review of the literature suggested that many characteristics that business, industry, government, parents, and education may expect from high school graduates are probably desirable in college graduates. The survey questionnaire was sent to 120 furniture designers active within the home furnishings industry. Respondents provided demographic information, identified emphases in respondents' professional practice, recommended instructional methods and emphases, and identified expected levels of furniture design graduates' achievement in both ability and knowledge areas. A graphic matrix was developed to illustrate how this information could be structured into the current furniture design curriculum. (Appendixes include a list of 18 references, course descriptions, a suggested plan of study, and the instrument.) (YLB)

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CONTENT, STRUCTURE, AND SEQUENCE OF THE DETAILING DISCIPLINE AT KENDALL COLLEGE OF ART AND DESIGN

by

Bruce E. Mulder

Final Project

Submitted to the

Faculty of the School of Education

of the

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If this document, or any part thereof, has merit or is useful to the education of Furniture Design students, these individuals deserve due credit and thanks, and above all, S D G.

B. E. M.

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CHAPTER ONE

Project Proposal

Content, Structure, and Sequence of the Detailing Discipline at Kendall College of Art and Design

The focus of this study is the Detailing discipline which is taught as a sequence of studio courses within the Furniture Design program at Kendall College of Art and Design (Kendall). This program has never formally elicited content and achievement expectations for detailing from the design profession. Such information could be used to construct instructional goals and objectives which address student learning abilities, and promote them toward minimum achievement levels.

Importance and Rationale of Study

The purpose of the Furniture Design program is to prepare students to their highest potential as product designers, primarily for a career in the commercial home furnishings industry (Kendall, 1991). Detailing attempts to educate students to a professional level in the ability to develop and communicate design ideas through a graphic technical language (Kendall, 1989).

A detail, the document made by a detailer, serves as a means of communication between a designer and the furniture industry. The designer uses a detail to graphically develop ideas, formulate instructions, and transmit these to the manufacturer. The manufacturer

interprets this information to make and reproduce a furniture object which accurately images the designer's intent (Spence & Griffiths, 1991).

Effective communication through a detail requires proficiency in three areas. These include a knowledge of design information, the transmission of this information through a graphic technical language, and the manipulation of tools used to execute that language.

Within a curriculum that includes academic studies, art history courses, and studio electives, the Furniture Design program requires studio courses which are specific to the furniture design profession. Parts of that specific studio exposure place emphasis on aesthetic aspects of design. Others emphasize technical aspects. Detailing teaches the integration of both the aesthetic and technical aspects.

The Furniture Design program devotes over thirty percent of its curriculum to the Detailing discipline (Kendall, 1989). This is due to the significant role of detailing within the furniture design profession. It also reflects the time and effort required by the students to adaquately learn, integrate, and apply the elements contained in the discipline.

Based upon uneven student outcomes in this area of study, however, it would seem that the program should

allocate an even greater percentage of the curriculum to detailing. These uneven outcomes have been observed over the past several years by the instructors of the discipline.

Student outcomes demonstrate uneveness in two respects. Students do not all attain a minimum level of achievement when they attempt similar types of detailing problems. Secondly, when students detail from their own design work, which is typical during a major portion of the sequence, this practice does not necessarily transfer to a common student achievement which would otherwise be expected from their working similar types of problems. These uneven outcomes seem to indicate a problem in both the makeup of and student achievement in that content.

Because the Furniture Design program has never formally elicited from the profession content and achievement expectations for detailing, its instructors have felt limited and less than secure in the determination of detailing outcomes.

In order to promote the student achievement levels toward a professional status, the program must identify professional expectations. Achievement expectations, however, are meaningless without a content and a content structure which is designed to lead to these goals. Student success in the discipline is best achieved

through a content structured to address student levels of learning.

Background of the Study

Knowledge of Kendall's history, the Furniture Design program emphasis, and the industry-specific nature of detailing will help to identify problems concerning detailing. Later, methods to address these problems will be discussed. The author will select a method of solution appropriate to the area of study.

Institutional History

The David Wolcott Kendall Memorial School of Design (Kendall) was incorporated on May 11, 1929 as a non-profit institution. It was dedicated to the provision of quality education for students of the visual arts. Through her last will and testament, Helen M. Kendall established the school as a memorial to her late husband. Besides being a patron to aspiring artists, Mr. Kendall was a talented and successful furniture designer (Kendall, 1985).

When opened in 1931, the school was located in Mr. Kendall's former residence at 145 Fountain N. E., in Grand Rapids, Michigan. Initial enrollment consisted of 35 students. Kendall relocated to 1110 College N. E. in 1962 after a period of growth following World War II. By 1969, full-time enrollment had swelled to 465 students.

In 1983, Kendall purchased and renovated its current facility at 111 Division North, in Grand Rapids. Enrollment peaked at 750 students in 1988. By that time Kendall offered courses in seven major areas of study (Kendall, 1985).

Kendall enlarged its original Fine Arts offering in 1932 to include Furniture Detailing. This inclusion developed into two major programs, Furniture Design and Interior Design. In 1948 a Commercial and Advertising Art program was added. The school, in 1963, identified courses it considered basic to all the major programs of study. Students were required to take these courses, called the Foundation program, in their first year of study. Fine Arts Illustration became a fourth major program offered by Kendall in 1964. During the 1980's the Broadcast/Video Design, Environmental Design, and Industrial Design programs began. During this same time the Fine Arts program was separated from the Illustration program (Kendall, 1985).

As the result of a college-wide curricular revision in 1988, Environmental Design was removed as a major. This program was a synthesis of Interior Design and Furniture Design. The college-mandated limitation to a maximum requirement of 120 credit hours for graduation made this program impossible to accomplish. In 1991,

Kendall eliminated the Broadcast/Video program, citing low enrollment and disproportionate costs as reasons. Kendall currently grants a Bachelor of Fine Arts degree in Visual Communications (Advertising), Interior Design, Industrial Design, Illustration, Furniture Design, and Fine Arts.

In 1972, Kendall received accreditation with the National Association of Trade and Technical Schools. The State of Michigan in 1978 permitted Kendall to grant the Associate of Fine Arts degree. In 1979, this authorization grew to include the Bachelor of Fine Arts degree. Since that time, Kendall, now considered a college-level institution, applied for and received accreditation from the North Central Association of Colleges and Schools (NCA), and the National Association of Schools of Art and Design (NASAD). In keeping with its degree-granting status, Kendall School of Design changed its name to Kendall College of Art and Design (Kendall, 1985).

Furniture Design Program Emphasis

The nature of the Furniture Design curriculum is a product of two major interacting factors. The first concerns the nature of the industry for which this program educates designers. The second concerns the program's constancy of focus throughout Kendall's history.

The Home Furnishings Industry

For many years Grand Rapids was considered the center of manufacturing, and the primary wholesale market for the nation-wide home furnishings industry. This occurred from the last quarter of the 19th Century until the 1930's (Lydens, 1967).

During that period, the industry churned out product in a multitude of style categories, both traditional and contemporary, to satisfy consumer demand. The principle material used for manufacture was wood (Lydens, 1967).

Although the center of manufacturing and marketing eventually shifted to North Carolina following World War II, wood material and style diversity continues to dominate the industry (James, 1992). As in former years, this emphasis reflects consumer preferences for furnishing their homes.

Program Focus

The second factor concerning the nature of the Furniture Design program grew out of the need for qualified designers in the furniture industry. At its inception, the program's curriculum trained students in the type of furniture design which was wood and style oriented. The program continued with that emphasis, and has been successful in its endeavor (Deihl, 1992).

Kendall continues to attract students who wish to study this type of furniture design. The college estimates that 80 percent of the designers who serve the home furnishings industry are alumni of its Furniture Design program (Bean, 1992). This program continues to target a specific industry. That industry's principle material of manufacture continues to be wood. Its product characteristics continue to reflect a broad range of styles.

If it is true that Kendall wishes to continue educating designers for the industry, the Furniture Design program must offer a curriculum which is wood based and style oriented (Deihl, 1992). But the curriculum must set the types of standards which are expected in a college education. These standards must address all disciplines, not the least of which is Detailing.

Nature of Detailing

The elements of detailing consist of a technical language, the tools, and design information. These elements are the same for all forms of drafting. There are, however, significant differences between detailing and other forms of drafting.

Technical Language

Detailing is the name of the graphic technical

language used to communicate information about furniture. It is an applied form of drafting. Discriptive geometry is the grammar of drafting. The immediate physical document resulting from drafting is called a technical drawing. Blueprint reading is the interpretation of all ideas expressed in a technical drawing (Giesecke et al., 1987). Product engineers interpret technical drawings for manufacturers so that designs can be realized. Execution of the technical language through drafting cannot take place, however, without using an instrument system, or tool.

Tools

There are four instrument systems which can be useful tools for a draftsperson. The fundamental system uses a T-square.

The T-square. This instrument, in the form of the letter T, permits the drawing of straight lines made perpendicular to the edge of the drafting board. Equipment used with the T-square may include pencils or lead holders, erasers, measuring devices, templates, irregular curves, compasses, and triangles (Giesecke et al., 1987). This additional equipment is also necessary in the use of the parallel bar system.

The Parallel Bar. This system consists of a movable drawing edge, or bar, kept parallel to an edge

of the drafting board by means of wires and pulleys. The bar is parallel and nearly equal in length to that edge of the board.

The Drafting Machine. This system also makes use of a movable bar. This bar is guided on a track which is attached to one edge of the drafting board. It is located perpendicular to that edge. Attached to the bar is an adjustable arm, consisting of two rules which are set at 90° to each other. These arms are used as drawing edges and measuring devices. Additional equipment used with this system may also include that which is used with the T-square system.

Computer Applications. Electronic technology has made feasible the use of Computer Assisted Drafting (CAD) for detailing. A computer screen is the drafting board. Instruments of drawing include the keyboard and alternate input devices such as mice, scanners, and graphics tablets. Output devices permit the electronic transfer of design information between designers and engineers. Plotters permit a transfer of information to paper (Bullough & Beatty, 1987).

Regardless of which instrument system may be the most useful tool to execute the detailing language, the information transmitted must contain the design.

Design Information

There are five types of information which a designer must consider while detailing. These include the function of the object, materials used, structure of the object, the method of its construction, and appearance (Spence & Griffiths, 1991). As in other applications of drafting, these types of information are used in the detailing of commercial household furniture.

Drafting Differences

The peculiarities of any application of drafting are specific to the type of product for which drafting is employed. Detailing differs from technical drafting because it is a drafting application specific to furniture design. What separates detailing from most other forms of drafting is the size of the scale used.

Industrial designers of minute or hand-held objects draft these objects at a scale which is greater than life size. Architects draft buildings at a scale which is less than life size. A furniture designer details a furniture object at exactly life size.

This difference determines the quantity and types of non-graphic information shown on the detail, and the size of the drafting board needed. The life-size scale results from the designer's need to pay critical

attention to small detail of individual parts of an object, and their relative proportions.

Drafting an object in a scale other that life size requires the extensive use of a dimensioning system. This non-graphic information is used to completely describe the size of every aspect of each part of the object. Dimensioning also describes the relationship of parts to each other, and to the whole. Because of the scale used in most applications of drafting, the paper which is used seldom exceeds 18" by 24" in size (Giesecke et al., 1987).

Furniture designers detail objects at a life-size scale, and do not dimension the individual parts of the object. They usually show only the overall size dimensions. A blueprint reader takes patterns directly from the detail. The dimensioning of individual parts in furniture detailing is considered redundant.

Because furniture is usually larger than 18" by 24", the paper used for detailing exceeds in size that which is used by other types of designers. Larger paper size requires a larger board size. Detailing boards are typically 44" wide. They vary in length from five to ten feet.

The size of the board, paper, and the scale used to detail allows designers to correctly judge proportion.

Working at full scale allows the furniture designer to more easily adjust the object's total proportions, relative proportion of the parts, and even small features of the individual parts.

The design of the individual parts of a furniture object is as important as the design of the whole. Their features, size, and proportion greatly affect the aesthetic appearance of the total object. Therefore, while detailing a piece of furniture of a particular style, the designer must pay close attention to minute part features which characterize that style. The design of a turning, for example, is closely related to the styling of the object for which it is a part. Its minute features must be shown correctly, and in relative proportion to the turning. The designer determines the turning size in relative proportion to the total furniture object (Spence & Griffiths, 1991). By controlling the design in this way, through the detailing process, the designer of home furnishings communicates ideas accurately and responsibly.

Current Detailing Curriculum

For a better understanding of the problem which exists in the Detailing discipline, it is important to examine the detailing courses and their prerequisite.

The detailing curriculum at Kendall consists of

four, three-credit-hour studio courses. Students take these in sequence. Each course uses the preceding course in the sequence as its prerequisite. Detailing I uses Technical Drafting as its prerequisite. Detailing III uses Furniture Construction as an additional prerequisite (see Appendix A for course descriptions and their prerequisites).

The total number of credits included in the detailing sequence represents 31 percent of the 39 studio credits which are specific to the profession. The total drafting sequence, including Technical Drafting, represents 38 percent of that 39 credit total (Kendall, 1989).

Technical Drafting. This course is taken from the Industrial Design curriculum, and can be used by any major program which uses a form of drafting as its graphic technical language. Technical Drafting teaches the basics of drafting, and was designed for the student with no previous drafting experience. Furniture Design students take this course no earlier than the first semester of their sophomore year (see Appendix B for suggested plan of study). Its course description states that it

> enables students to use drafting instruments for geometric construction, introduces principles of orthographic projection, pictorial drawings,

> auxiliary and sectional views, threads and fasteners (convention and coordinate), dimensioning, detail and assembly drawing. The ability to present three-dimensional concepts on a two-dimensional surface will be emphasized (Kendall, 1989, p. 16).

No text is used for this course.

Detailing I. The course of study for Detailing I includes the "...use of small scale product drawings and detailing plates, which are brought to full scale and detailed, to show standard construction methods" (Kendall, 1989, p. 19). No text is required. Its course description states that it

> studies furniture construction methods using standard three-view working drawings, emphasizes the development of understanding of drafting techniques which includes full-size detail layout, notation and lettering, part and product dimensioning. In addition, emphasis is placed on typical construction standards and joinery (Kendall, 1989, p. 19).

Detailing II. According to its course description, Detailing II "introduces practical problem solving methods for furniture design and construction using the furniture detail as a vehicle. The details are drawn from assigned archetypes and from the students' own product design work" (Kendall, 1989, p. 21). Besides detailing plates and student-generated designs, the course of study includes hardware and material selection. Wood samples, sample joinery, product

catalogs, and hardware catalogs are available for reference. No text is used.

Detailing III. The description of this course states that "as an advanced course in detailing, more demanding designs are detailed approaching the professional level. Students apply industrial standards to working drawings, with focus on material utilization, production methods, and product development" (Kendall, 1989, p. 24). As a course of study, students work with style types from their own product designs. No text is used.

Detailing IV. The description for this course states that it

> treats the students' work as approaching the professional level. Students must be able to define and defend full-size details as to commercial demands, line comprehension, continuity of view, and applicability to specific manufacturing methods. Knowledge of materials, hardware, and suitability to manufacture are expected to be understood....The course of study revolves around the development of detail drawings of products designed and developed by the students. Emphasis is on the aesthetic and technical interpretation of product designs as designed or developed by students (Kendall, 1989, p. 26).

No text is used.

Source of the Problem

Based on observation by the Furniture Design faculty, there are three factors which contribute to uneven student outcomes in the Detailing discipline.

These include the method of project assignment during a major portion of the sequence, the impact upon the Furniture Design program resulting from a college-wide curriculum restructuring, and a lack of appropriate textbooks. A future incorporation of CAD into the discipline is an additional factor which may affect student outcomes.

Project assignment. Project assignment during the detailing sequence changes from instructor-generated to student-generated material. Concurrent with this change in project assignment, the concepts which are studied progress from simple furniture applications of drafting to complex furniture-design problem solving. Students' progress rests upon learned information from allied disciplines, whether they are prerequisite or concurrently studied courses. This change and progression starts in Detailing I.

In Detailing I, students are assigned detailing projects based on detailing plates furnished by the program. These plates are a vehicle to help students apply their drafting ability to detailing problems. Each succeeding plate increases in difficulty. Their use continues into the Detailing II course, usually until students have designed their own body of work (Kendall, 1989).

Because students at the Detailing II level are also taking Furniture Design I, this detailing course is their first opportunity to test and prove their design work on a detail. Students by this stage have also studied information and skills basic to detailing. These include art history, design history, ornamentation, furniture measurement, sketching, and common industrial joinery and standards (see Appendix B). Without this background, students would be stymied in their self-generated course material.

When students use their own design work for course material, they gain ownership in their projects. This ownership helps to assuage the difficulty inherent in complex detailing problems. Also, this method of assignment acquaints students with a practice which will continue throughout their profession.

This method of project assignment should lead to positive student outcomes. However, this method also limits a student's exposure to only those design problems inherent to their own designs. All of the students are not necessarily exposed to all critical design problems. Additionally, students might attempt types of problems for which they are inadaquately prepared. Finally, random project selection does not necessarily promote student learning in all desired content areas,

or toward achievement levels which may be expected by the profession.

Curriculum restructure. Kendall, in 1988, mandated a restructuring of the college curriculum. It stated three guidelines for this task. First, the maximum number of credit hours required for graduation would remain 120. Second, each major program must include five studio electives, allowing students a minor emphasis of study. Third, regardless of intended major, all students must complete an identical Foundation program. These parameters effected changes in the Furniture Design program and, therefore, the detailing sequence.

Under the old curriculum, students studied Technical Drafting during the second semester of their freshman year. Under the new curriculum, intended Furniture Design students were required to include Perspective in their first year of study. This pushed Technical Drafting into the second year of study. Consequently, a student's introduction to detailing would occur a semester later under the new curriculum. The replacement of Technical Drafting by Perspective in the Foundation program also eliminated three credits from the major curriculum.

Formerly, the Furniture Design curriculum allowed three studio electives. The requirement of five studio

electives meant an inclusion into the curriculum of two more electives. This, in turn, eliminated six more credits from the major-specific studio courses.

To accomodate these requirements, the Furniture Design program changed its curriculum. It combined content from two existing courses into a single course named Furniture Studio (see Appendix B). The program also eliminated three credits each from the Detailing and Furniture Design sequences. What may or may not have caused positive student outcomes within the former detailing sequence, now had three fewer credits in which to accomplish it.

This situation meant that there was an even greater need to identify appropriate content and achievement expectations in that content for detailing. It also seemed important to determine which instructional emphases would best promote achievement of that content.

Textbooks. One of the greatest frustrations for instructors in the Furniture Design program is a complete lack of textbooks. This lack should not be surprising, however, when one considers the focus of the program and the absence of like programs at other colleges.

Without a text, the detailing instructor has no guidelines for course content or its structure. A textbook could provide validation and ranking of

discipline content (Oliva, 1988). But without this the detailing instructor must, to a large degree, rely on his or her own expertise. The program must seek help in this area from outside sources.

Computer Technology. The technology of CAD has, over the past ten years, improved to the state where it can now be used for furniture detailing. The Furniture Design program recognizes this, and has taken steps to integrate CAD into its program. Kendall's 1992 budget identifies monies for the purchase of appropriate computer hardware and software to be shared by the Industrial Design and Furniture Design programs.

The Furniture Design program has yet to determine how and where it will integrate the instruction and application of this tool into the detailing curriculum. As time progresses, professional expectations for student abilities in CAD will, no doubt, increase. Their current expectations remain unknown.

Problem Statement

If the Furniture Design program expects the detailing sequence to promote student outcomes which satisfy professional expectations, it must identify approprate content and structure in a way which causes student learning to progress toward that goal. This content must be specified and structured through

instructional goals and objectives. Content structured in this manner can better address student learning levels (Oliva, 1988).

Without clearly identified professional expectations, instructional goals and objectives, however they are stated, remain aimless. As a result, it is difficult to both identify and implement sequenced content which addresses student learning levels. This is especially true in courses where students virtually determine content material.

Under these conditions, any number of credit hours which the program allocated to detailing would seem poorly spent. One wonders if it would matter whether the students worked with a T-square or a mouse. Unfortunately, this situation exists in the Detailing discipline.

On a more positive note, Kendall's facilities create a safe and commodious environment for teaching and learning. Kendall provides staff and services which support education (Kendall, 1987). The students, through previous achievement, demonstrate the ability to learn, apply their knowledge, and progress toward goals. The college has, over the decades, continued to employ as instructors people who demonstrate a high level of ability in their design and teaching professions. All of the elements exist in which a desired education can

occur. But a curriculum can cripple an education if content areas are not validated or prioritized.

Oliva (1988) states "instructional goals and objectives should be validated and put in order of priority. Teachers should know whether the instructional goals and objectives are appropriate and which are the more important" (p. 395). He further indicates that because instructional goals are content specific, it may be wise to validate and prioritize them through persons trained in the field of specialization. He also suggests referring to "adopted textbooks, reference books, and curriculum guides" (p. 396). Helpful too are knowlegeable faculty members, curriculum consultants, and supervisors.

If drafting is a universal language (Giesecke et al., 1987), and detailing is a dialect of that language, then detailing for the home furnishings industry speaks with its own idioms. Unfortunately, few serious books or journals address this discipline from an educational perspective. A small number of books exist which tangentially refer to detailing in a stylistic context. Their focus, however, is the analysis of styles throughout history.

The faculty of the Furniture Design program consists of industrial consultants and practicing

furniture designers. Kendall has, throughout her history, employed furniture designers to teach in this program. These professionals have diligently attempted to form, direct, and teach a detailing content which they judged valuable to the education of student designers. However, the scope of their own professional practices may have limited the nature of the detailing content.

Validation and prioritization of content for instructional goals and objectives may also be obtained from personnel trained in the field of specialization. Although operating outside of an educational institution, design professionals who represent a diversity of emphases should be allowed to identify content and standards of achievement expected from entry level students.

Method

The author will conduct a survey among practicing furniture designers within the home furnishings industry. These designers will be chosen based upon their diversity of emphases and their length of experience. The survey will address content areas, and levels of achievement in those areas for the Detailing discipline.

Based on the data derived through this survey and a discussion of that data, the author will make

recommendations to the Detailing discipline, the Furniture Design program, and the college.

Statement of Purpose

The purpose of this study is to identify an appropriate general content, structure, and sequence for a Detailing discipline which promotes student achievement to levels which are considered professional.

This information will be used to make recommendations for changes in the Detailing discipline. Some of these changes may, as well, require that changes be made in the Furniture Design curriculum in general, so that the student outcomes will reflect content areas and achievement levels desired by the profession.

Limitations of Project

Although considered important, this study will not address the domains of learning. It is expected that individual instructors would consider these in their selection of specific course content.

This study will not attempt to identify specific course content or textbooks for the detailing courses or their prerequisite courses.

CHAPTER TWO

Literature Review

The process of research for this study revealed that there is a lack of serious literature which addresses both education and furniture detailing. The search for a solution of the problems which exist in the Detailing discipline at Kendall pointed toward the use of a survey questionnaire. Since the primary source of the information sought regarding detailing resides with the people who use the discipline on a daily basis, and since these people would be qualified to speak to the validation and prioritization of the discipline's content (Oliva, 1988), it seemed that a survey of these people would provide the best vehicle toward a solution.

Additional support for turning to the profession seems to exist in a current phenomenon which runs somewhat parallel to this study. The awareness within our nation of the lethargic state of the economy, and of industry's apparent inability to compete effectively at a global level, has compelled economists, industrial and labor consultants, and educators to seek solutions. The body of literature represented in this brief review focuses on the role of education in the solution of this national problem, and relates this role to student outcome expectations at the high school level.

This is understandable considering that 50 percent of the high school students are not headed toward a

college education, and will compete for careers in various positions in industry following their formal education (O'Neil, 1992).

The parallel seen between this phenomenon and the focus of our study lies in the need to determine appropriate standards for student outcomes. That the students targeted in the reviewed literature and Kendall's students are at a different level of education would not seem to diminish the importance of determining appropriate standards for their outcomes. The standards may, perhaps, differ. What appears to be pertinent to our study, however, lies in whom the writers indicate as appropriate sources for determining student outcomes.

Gap Between Education and Career

In the context of the current economy and the bleak outlook for future unprepared graduates, John O'Neil (1992) says, "experts on education are worried by the growing gap they see between the capabilities [of students], especially those not bound for college, and the skills, knowledge, and habits of the mind that employers seek" (p. 6). He indicated that the entry level readiness of students into the workforce will be critical if industry in the United States tries to become competitive globally. These new workers will be "...increasingly expected to think on their feet, solve problems that require

several steps, and apply their knowledge and skills in new contexts" (p. 7).

Targetting the gap between education and the workplace, O'Neil indicates that the students within the U. S. are generally left on their own to link their school experience to work. "Specialized vocational training, cooperative education, and other school-based programs serve a relatively small proportion of students..." (1992, p. 7). He further indicates that there have been steps made toward closing this gap. These include an "...erosion of the long standing wall separating academic and vocational programs, ...the appearance of better information about the skills, knowledge, and habits of the mind that students need to prepare for the workforce ...and the development of systematic plans to address the school-to-work transition issue" (p. 8,9). O'Neil states that these ideas originate from the U. S. Department of Labor's Secretary's Commission on Achieving Necessary Skills (SCANS).

In "Making Transitions from School to Work", authors Byrne, Constant, and Moore (1992) state that "for a majority of American students, what they learned in school is not adaquately related to what they need to know after leaving school" (p. 23). Some

of this was due to the schools not feeling

> ...responsible for students after they left the classroom. Employers blamed schools for entry-level workers' poor academic preparation and lax work habits....Yet, these same employers had minimal contact with the schools and provided little in the way of structured training for the high school students or recent graduates they hired, often preferring to avoid hiring them entirely (p. 21).

The unions didn't help as they

> ...concentrated their efforts on their membership, the bulk of which consists of mature workers.... Finally, job training and placement programs concentrated on equipping dropouts and recent graduates with minimal technical skills, training and job seeking skills, only to leave them at the door of the employer (p. 23).

Regarding business and education partnerships, these authors state "perhaps the greatest breakthrough has been the growing recognition that school reform requires the full committment of all partners to systematically change the way we approach education in this country" (p. 24). Under the National Alliance of Business' Quality Connection Consortium, employers provide a job which serves, not only, as "...an incentive to remain in school...", but which also is "...a significant part of the learning experience, designed to teach skills by embedding them in a curriculum keyed to the requirements of the job" (p. 24).

In his article "Taking Action on the SCANS Report", Arnold H. Packer (1992) lists the three-part foundation

of skills, and five competencies which the 31-member SCANS Commission formulated as representing an essential preparation for all students. He also recommended a partnership between schools and employers.

Packer acknowledges a recent change in high-performance industry's approach to business to the one advocated by W. Edwards Deming. This approach uses "...all their workers' skills to relentlessly pursue excellence, product quality, and customer satisfaction" (p. 29). Packer also states "...employers cannot adopt Deming's approach unless they can find workers with the skills needed to implement it" (p. 29). Later he says, "just as businesses must, so schools must become high-performance organizations....The most effective way to teach skills is in the context of real-life situations and problems" (p. 30). Further, he states that "SCANS executive advisors...believe that once teachers know what skills are needed in the workplace, they will be able to teach them" (p. 31).

Education, Economy, and Productivity

In a comparative analysis of the living standards of the U. S. and both the former third world countries and our World War II opponents, Magaziner and Clinton (1992) paint a dark picture of the U. S. economy and the education which prepares students for work in that

economy. They cite low productivity in the American workforce since the 1970's as a major problem, and suggest as a remedy to this problem a "move to high-performance work organizations" (p. 11). Also, "we can give our frontline workers much more responsibility, educate them well, and train them to do more highly skilled jobs" (p. 11). To do this "we must fundamentally change our approach to work and education" (p. 11).

Magaziner and Clinton referred to the Commission of the American Workforce in 1989 Report which identified some problems and solutions. Those which specifically apply to this study are the following. "We lack the standard of achievement and few students are motivated to work hard in school..." (p. 11). The commission recommended that "a new educational performance standard be set for all students, to be met at or around age 16" (p. 12). Another problem stated is that "other industrial nations have multi-year career-oriented educational programs that prepare students to operate at a professional level in the workplace" (p. 12). The commission recommended that "technical and professional certificates...be offered across a range of services and manufacturing occupations" (p. 12).

Academic Achievement and Employment

In his article "Why U. S. Students Need Incentives to Learn", John H. Bishop (1992) cites statistics which indicate low academic achievement by students in the nation's secondary schools, leading to difficulty in initial employment and low wages. The academic decline of these students "...can be attributed in part to their correct assessment of the lack of connectedness between work and school" (p. 15).

However, even greater academic achievement increases wages slightly. "One reason wages do not reflect productivity is that employers lack good objectives on the academic competencies of young job applicants" (p. 15). Because no nation-wide common standard of evaluation exists, employers do not want to risk hiring a person of unknown competence. Therefore graduates find it difficult to find jobs which will train and give them experience.

Bishop proposes that an external assessment for student competence be created at the national level. He suggests that this would place the teacher in the position of being a coach or mentor rather than the judge of the student's abilities. In this type of team effort, "...competition and rivalry are not absent, but they are offset by shared goals, shared successes, and

external measures of achievement..." (p. 17).

Stemmer, Brown, and Smith (1992) in their article "The Employability Skills Portfolio", list an employability skills profile developed by the Michigan Employability Skills Task Force. This group, composed of "...leaders from business, labor, government, and education determined the general skills that every student should have, not only for entry-level jobs, but for jobs at all levels" (p. 32). These skills fell under the general categories of Academic Skills, Personel Management Skills, and Teamwork Skills.

It should be noted that besides getting the involvement of teachers and parents, the task force involved local businesses. They asked "...local business leaders to discuss employability skills from their perspectives with the school board, teachers, and in the classroom" (p. 34).

Literature Discussion

These articles suggest many characteristics which business, industry, government, parents, and education may expect from high school graduates. There is no doubt that these are desired in college graduates as well. It is not, however, the purpose of this study to discuss the merits or faults of these suggestions. But it is difficult to overlook the fact that education is

increasingly listening to business and industry as a legitimate contributer to the definition of those characteristics. Whether different economic conditions would reverse this apparent influence remains to be seen. One positive result of this current phenomenon seems to be a realization on the part of both education and industry that either one does not exist in isolation from the other.

Insofar as the Furniture Design program leads to a profession which serves a specific industry, it would likewise seem incumbent upon this program to listen to the profession's and industry's expectations for student outcomes. This should be especially true since Kendall's Furniture Design program continues to educate a large percentage of that industry's designers. Secondly, because detailing is such a key means of communication between the profession and industry, their expectations regarding content areas and student achievement levels for detailing should be valued. The survey questionnaire used in this study is an attempt to listen to the profession and the industry concerning the Detailing discipline at Kendall.

CHAPTER THREE

Project Report

The literature reviewed in the preceding chapter strongly suggests that in preparing students for the job market, educational institutions should pay attention to the qualities which industry seeks in its employees. If an education prepares students who will be able to serve an industry, contribute toward its success, and thereby serve the economic well being of this country, then perhaps that education is successfully working toward accomplishing goals which consider the economic well being of its students and society.

The segment of the home furnishings industry which can speak directly to the Furniture Design program, and specifically to the Detailing discipline, is the design-professional sector. A designer's livelihood depends upon a responsiveness to the furniture industry, and upon a design ability which leads industry into new territory. Both of these roles are enhanced through the designer's ability to communicate effectively through a detail.

Since Kendall's Furniture Design program has never formally determined from the profession its expectations for student outcomes in detailing, it seems, then, that there is a need to elicit that information for the program, for the sake of the students. The instrument used to gather this information will be a survey questionnare conducted through the U. S. Postal Service.

Subjects

The survey questionnaire was sent to 120 furniture designers who are currently active within the home furnishings industry. The sources used to locate these designers were the directories of the Grand Rapids Furniture Designers Association, the American Society of Furniture Designers, and the American Furniture Manufacturers Association.

It was inevitable that a majority of the addressees were Kendall alumni since its Furniture Design program has supplied a large percentage of the industry's designers throughout Kendall's history. Their familiarity with the program plus their experience in the workplace would hopefully give them an objectivity desired for this study.

Instrument

The survey (see Appendix C) consisted of a four sided document which included a cover letter, a statement of background information, a participant profile, and four parts concerning detailing itself.

The cover letter explained to the addressee the purpose of the mailing, invited that person to participate in the survey, and explained what was to be done with the gathered information. The letter also mentioned the enclosed stamped return envelope, and thanked the

potential respondent for his or her participation.

The paragraph containing the background information explained the current detailing sequence as taught at Kendall. This included the mechanics and the credit-hour/time parameters of the sequence and its prerequisite, Technical Drafting. This information was included to establish for the reader the time context in which students can currently learn detailing.

The participant profile (Part I) requested information which would establish demographics about the respondents. Certain of this information would be used to segregate respondents into groups against which detailing questions would be tested. The types of information requested in Part I included professional position/job function, educational background, use of CAD, percentage of studio time spent in detailing, and the areas of design emphasis of their professional practice.

Part II concerned the prerequisites of the Detailing discipline. The respondents were asked to check off which of the listed ability and knowledge areas they considered to be prerequisite to the study of detailing.

Part III concerned methods and emphases of instruction which could be useful to the teaching of

detailing. The designer was asked to respond to each of the 21 statements in this part in one of four ways. The possible responses included:

1. Indicates strong disagreement;
2. Indicates disagreement;
3. Indicates agreement;
4. Indicates strong agreement.

Part III was included to indicate to the Furniture Design program the degree to which certain activities should be emphasized, and the methods which might best lead to these emphases.

In separate columns, Part IV listed knowledge and ability areas which the profession may desire students to achieve before graduation. Spaces were provided for respondents to add items they regarded as worthy of achievement. The respondents were asked to indicate in front of each listed and added item the level of achievement they would expect students to attain by graduation. The possible responses which the questionnare suggested included the following levels of achievement:

A. Highly proficient to good;
B. Good to medium;
C. Medium to threshold.

Part IV was included because the author wished to

gather profession-generated content areas and levels of achievement expected in those areas. These could then be used to determine student outcomes for the detailing sequence.

Part V allowed room for respondents to add comments regarding detailing or any other part of the Furniture Design curriculum.

Results of Survey and Discussion

The statistics presented in this study reflect a response from 64 subjects out of the 120 addressees. Because more information was gathered than was pertinent to this study, the reports on the results and the discussions will focus only on those areas which speak to the problems defined in this study. These areas fall within Sections A, B, C, F, and G of Part I, and all of Parts III and IV of the survey instrument.

Participant Profile

Personnel, Position, and Tools

The tabulated results concerning these areas derive from Sections A and B of Part I of the survey, and are found on Figure 1.

Of the 64 respondents, 32 are employed within individual manufacturing companies. These people are considered staff personnel. These personnel categorized themselves into three position types. These included

24 designers, three detailers, and five _others_. The other category included two product engineers and three design directors.

Two of the staff designers and the two product engineers use CAD to detail.

The remaining 32 of the total respondents are independent personnel. This classification is sometimes termed _free lance_. All of this type of respondent categorized themselves as designers. Of these, five use CAD to detail.

Therefore, the total of respondents were equally divided between staff and independent personnel. This was fortunate for the study since the author anticipated that these two types of respondents might possibly generate different data due to the nature of their employment. Because the Furniture Design program supplies designers for both areas, it is important for the program to be sensitive to the needs of both. If the response from both areas were to indicate unity on any of the survey issues, it would seem that more weight would be added to the validity of their response in that issue. This analysis could conceivably be applied to any issue responded to by agreeing yet diametrically segregated groups.

The author expected that a greater percentage of

Figure 1. Differentiation of personnel, position, and tool use.

	POSITION TYPE	TOOL USE	INDIVIDUALS	% IN POSITION CATEGORY	% IN PERSONNEL CATEGORY	% OF TOTAL RESPONDENTS
STAFF PERSONNEL	DESIGNERS	CAD	2	8.3	6.3	3.1
		NON-CAD	22	91.7	68.7	34.4
		TOTAL	24	100.0	75.0	37.5
	DETAILERS	CAD	0	0	0	0
		NON-CAD	3	100.0	9.4	4.7
		TOTAL	3	100.0	9.4	4.7
	OTHER	CAD	2	40.0	6.3	3.1
		NON-CAD	3	60.0	9.4	4.7
		TOTAL	5	100.0	15.6	7.8
	TOTAL		32	—	100.0	50.0
INDEPENDENT PERSONNEL	DESIGNERS	CAD	5	15.6	15.6	7.8
		NON-CAD	27	84.3	84.3	42.2
		TOTAL	32	100.0	100.0	50.0
	DETAILERS	CAD	0	0	0	0
		NON-CAD	0	0	0	0
		TOTAL	0	0	0	0
	TOTAL		32	100.0	100.0	50.0
	COMBINED TOTALS		64	—	—	100.0

the respondents would indicate that they used CAD as a detailing tool. Therefore, the parts of the survey which compare the results of CAD users to those of the non-users may have limited validity.

Time Devoted to Detailing

Because this study focuses on detailing, it seemed important to find out whether the respondents actually detailed, and to what extent. Section F of Part I in the survey requested this information, and the tabulated results are shown on Figure 2.

Of the 64 respondents, 11 spend 0%-25% of their studio time detailing, 27 spend 25%-50% detailing, 19 spend 50%-75% detailing, and seven spend 75%-100% of their studio time detailing.

Of the nine respondents who are CAD users, four spend 0%-25% of their studio time detailing, two spend 25%-50% detailing, and two spend 75%-100% of their studio time detailing. The four CAD users who spend the least percentage of their studio time detailing are staff personnel. The five remaining CAD users are independent personnel.

Both the doing and supervision of detailing was listed in this Section because it is possible that a designer may not actually detail, but that this function is delegated to a detailer employed for this purpose.

Figure 2. Studio time devoted to detailing.

	POSITION	TOOL USE	0%-25% OF TIME	% OF GROUP IN CATEGORY	25%-50% OF TIME	% OF GROUP IN CATEGORY	50%-75% OF TIME	% OF GROUP IN CATEGORY	75%-100% OF TIME	% OF GROUP IN CATEGORY
STAFF PERSONNEL	DESIGNERS	CAD	2	33.3	0	0	0	0	0	0
		NON-CAD	4	66.7	3	100.0	7	100.0	2	100.0
		TOTAL	6	16.7	3	37.5	7	29.2	2	8.3
	DETAILERS	CAD	0	0	0	0	0	0	0	0
		NON-CAD	0	0	0	0	1	100.0	2	100.0
		TOTAL	0	0	0	0	1	33.3	2	66.7
	OTHER	CAD	2	66.7	0	0	0	0	0	0
		NON-CAD	1	33.3	1	100.0	1	100.0	0	0
		TOTAL	3	60.0	1	20.0	1	20.0	0	0
	TOTALS: STAFF		9	28.1	10	31.2	9	28.1	4	12.5
INDEPENDENT PERSONNEL	DESIGNERS	CAD	0	0	2	11.8	2	20.0	1	33.3
		NON-CAD	2	100.0	15	88.2	8	80.0	2	66.7
	TOTALS: INDEPENDENT		2	6.3	17	53.1	10	31.3	3	9.4
	COMBINED TOTALS		11	17.2	27	42.2	19	29.7	7	10.9

Since a designer wishes to retain responsibility for the design in such a situation, he or she must maintain standards for the detailer. The designer is expected to make critical design decisions during the detailing process, and exercise judgement on the acceptability of the finished detail. The ability to effectively oversee detailing comes through the education in and working of details.

The results from Section F are somewhat limited in that the author did not provide a category for those respondents who spend absolutely no time detailing or in the supervision of detailing. Although respondents who fit this description may have been likely to place themselves within the 0%-25% category for time spent detailing, there was no way to cull their surveys.

Educational Background

Section B of Part I in the survey concerned the educational background of the respondents, and the tabulated results of this Section are found on Figure 3.

These results indicate that the sources of the respondents' detailing ability were: formal education, 27%; apprenticeship, 3%; a combination of the first two choices, 69%; and other sources, 2%.

This suggests to the author that a majority of the respondents recognize that their learning of detailing

Figure 3. Sources of respondents' detailing ability.

SOURCE OF DETAILING ABILITY	INDIVIDUALS	% OF TOTAL
FORMAL EDUCATION	17	26.6
APPRENTICESHIP	2	3.1
COMBINATION OF ABOVE	44	68.7
OTHER	1	1.6
TOTAL	64	100.0

did not necessarily stop at the end of their formal education. While the intended result of this study is the improvement of formal detailing education, these results serve as a reminder that even the best designed detailing sequence cannot teach all that there is to know about the discipline. Nor can it cause students to learn all of what it contains. It is hoped, however, that an improved detailing sequence will better enable students to learn while at Kendall, and later through experience.

Areas of Design Emphasis

The purpose of Section G in Part I of the survey was to establish the diversity of emphases in the respondents' professional practice. The tabulated results are found on Figure 4.

The results of this Section indicate that there is indeed a diversity of emphases represented by the respondents. Those areas of emphasis which received a response from over 50% of the total respondents were: residential design, 84%; contemporary styling, 64%; traditional styling, 78%; case goods, 70%; and occasional (living room tables), 75%. Upholstery design, at 48%, came very close to the 50% mark and, therefore, cannot be ignored. The other areas which respondents listed included lamps, rattan and wicker goods, interior design layout, and accessories.

Figure 4. Areas of design emphasis.

EMPHASIS AREA	STAFF PERSONNEL	% OF SELECTION BY STAFF PERSONNEL	INDEPENDENT PERSONNEL	% OF SELECTION BY INDEPENDENT PERSONNEL	COMBINED PERSONNEL	% OF SELECTION BY COMBINED PERSONNEL
CONTRACT DESIGN	9	28.1	9	28.1	18	28.1
RESIDENTIAL DESIGN	25	78.1	29	90.6	54	84.4
CONTEMPORARY STYLING	18	56.3	23	71.9	41	64.1
TRADITIONAL STYLING	22	68.8	28	87.5	50	78.1
CASE GOODS	18	56.3	27	84.4	45	70.3
UPHOLSTERY	18	56.3	13	40.6	31	48.4
OCCASIONAL	18	56.3	30	93.8	48	75.0
OFFICE	8	25.0	9	28.1	17	26.6
OTHER	4	12.5	6	18.8	10	15.6

If the Furniture Design program is to adaquately prepare designers for entry into a profession which has many immediate or eventual emphases, then the program and the detailing sequence should address those areas adaquately.

Since the respondents indicated such a diversity of emphasis in their practices, it would seem that any concurrence of judgement shown by this group in areas regarding content and student achievement levels may add weight to the validity of that judgement.

Methods and Emphases for Instruction

The third part of the survey, as seen in Appendix C, can be divided into seven general categories. These include the following, and are listed with their applicable statement letters as found on the survey:

Detailing, statement A;

Content, statements B and C;

Derivation of subject material for projects, statements D, E, and F;

Industrial construction standards, statements G, H, I, J, K, and L;

Effective content on detail, Statements S, T, and U;

Related student skills, statement M;

Tools used, statements N, O, P, Q, and R.

Figure 5, which is contained on three pages, shows the

tabulated statistics for the first six of these categories. Figure 6 concerns the Tools category alone.

Detailing

Out of the 64 respondents, 98% agreed that detailing should be in the Furniture Design curriculum. This was, at least, a strong affirmation of the importance of the discipline to the program.

Content

Of the total respondents, 98% agreed that detailing students should be exposed to as many furniture forms as possible, and 94% of the total agreed that the detailing students should be exposed to as many style categories as possible. This appears to be a mandate for the discipline to cover a broad territory.

Derivation of Subject Material for Projects

In this area of concern, 69% of the respondents disagreed that all students should work on identical assignments, and 81% agreed that students should be assigned detailing projects derived from their own design work.

The Furniture Design program currently emphasizes that students detail from their own design concepts. One of the reasons for this method is to foster student ownership in their projects. Secondly, this method is used to avoid a lockstep approach to education. Finally,

since the program is, after all, design oriented students should concentrate on testing and proving new design ideas along with existing designs. Their own design work becomes the logical material for this endeavor. However, if the program is to ensure that students work on the same type of detailing projects, as 70% of the respondents called for, much more effort would have to be made in coordinating this approach.

First of all, the program would have to make sure that the students' design projects contain the same types of problems. Secondly, assignments in the courses which generate concepts would have to be stated such that students generate a body of work which contains the material useful to the Detailing discipline. It is becoming evident that an effective detailing sequence may demand better coordination among instructors, and within the total curriculum.

Industrial Construction Standards

The results in this area of concern indicate that 70% of the respondents disagreed that students would benefit most by detailing according to only one set of industrial standards throughout the sequence, but 83% of them agreed that students would benefit most by detailing from more than one set of standards introduced periodically throughout the sequence. Also, respondents

agreed (98%) that students should be allowed to solve construction problems in a variety of ways.

These results affirm most of the program's current methods used in the detailing sequence. The exception to the current method is in allowing students to solve construction problems in a variety of ways. By making use of this method, the discipline could enhance the students' problem solving abilities, a quality which is increasingly sought after by employers. Perhaps this method could be implemented effectively after the students learn a variety of useful industrial techniques for construction. The program probably should not, however, inhibit students in deriving innovative but sound solutions to their construction problems, or inhibit the teaching of problem solving skills directly, which students would then be expected to apply in their designs.

The respondents disagreed (70%) that concern for styling should dominate structural concerns, and 75% of them disagreed that structural concerns inhibited aesthetic goals. Further, 94% of the respondents agreed that a better designed object may be derived from detailing within the parameters of aesthetic goals, structural concerns, manufacturing capabilities, and cost constraints.

These results support the program's curre

emphasis upon the integration of these facets in the detailing process.

Effective Content on Details

That a furniture detail is an effective means of communication between the designer and the manufacturer was agreed to by 97% of the respondents. However, 86% of them disagreed that a designer's detail is useful only if it contains all construction and parts. Rather, 78% of the respondents agreed that an effective detailer must make accurate allowances for all construction and parts.

These results confirmed the program's practice of insisting that students, during the initial courses, learn about and show all construction and parts in their details. In the later detailing courses students are allowed to omit much of the construction and parts if the structure of the object conforms to an existing industrial standard. New forms or designs must, however, be thoroughly worked out in the detail. In order to make accurate space allowances, students must first know about and understand those parts for which they would make allowances. A key word in all of this discussion is accuracy. The program should probably more consistently insist that students be accurate in the execution of their details.

Related Student Skills

The author's inclusion of this area was motivated by Kendall's interest in the program's utilization of the woodworking lab, and by the author's interest in its possible effect upon the students' detailing skills. The respondents agreed (81%) that the students' detailing ability would be improved by actually constructing furniture.

This response affirmed some of what the program has tried to accomplish by introducing its Furniture Construction course in 1979. This course currently emphasizes the introduction to, and flexibility and limitations of industrial woodworking machinery (see Appendix A). While this emphasis is necessary to an extent in an introductory course, the program may also wish to consider incorporating on a regular basis a construction course which would allow for student-designed projects. The inclusion into the program of this type of course may promote student ability in solving 3-D problems, enhance their 3-D visualization, and thus advance their detailing ability.

Tools Used

The tabulation of the results in this area of concern are shown on Figure 6.

Apparently CAD users and CAD non-users value the

Figure 5. Instructional methods and emphases.

Statement	Type of Response	Staff Personnel		Independent Personnel		Response Simplified	Combined	
		No.	%	No.	%		No.	%
A.	1.	0	0	0	0	Disagree	1	1.6
	2.	0	0	1	3.1			
	3.	3	9.4	3	9.4	Agree	63	98.4
	4.	29	90.6	28	87.5			
B.	1.	0	0	0	0	Disagree	1	1.6
	2.	0	0	1	3.1			
	3.	6	18.8	4	12.5	Agree	63	98.4
	4.	26	81.3	27	84.4			
C.	1.	0	0	0	0	Disagree	4	6.2
	2.	1	3.1	3	9.4			
	3.	9	28.1	7	21.9	Agree	60	93.8
	4.	22	68.8	22	68.8			
D.	1.	1	3.1	0	0	Disagree	12	18.8
	2.	4	12.5	7	21.9			
	3.	15	46.9	14	43.8	Agree	52	81.2
	4.	12	37.5	11	34.4			
E.	1.	2	6.2	1	3.1	Disagree	19	29.7
	2.	8	25.0	8	25.0			
	3.	15	46.9	18	56.3	Agree	45	70.3
	4.	7	21.9	5	15.6			
F.	1.	4	12.5	4	12.5	Disagree	44	68.8
	2.	18	56.3	18	56.3			
	3.	10	31.3	9	28.1	Agree	20	31.3
	4.	0	0	1	3.1			

Figure 5, cont. Instructional methods and emphases.

STATEMENT	TYPE OF RESPONSE	STAFF PERSONNEL		INDEPENDENT PERSONNEL		RESPONSE SIMPLIFIED	COMBINED	
		NO.	%	NO.	%		NO.	%
G.	1.	5	15.6	8	25.0	DISAGREE	45	70.3
	2.	15	46.9	17	53.1			
	3.	11	34.4	5	15.6	AGREE	19	29.7
	4.	1	3.6	2	6.2			
H.	1.	0	0	1	3.1	DISAGREE	11	17.2
	2.	5	15.6	5	15.6			
	3.	18	56.3	16	50.0	AGREE	53	82.8
	4.	9	28.1	10	31.3			
I.	1.	0	0	0	0	DISAGREE	1	1.6
	2.	0	0	1	3.1			
	3.	23	71.9	11	34.4	AGREE	63	98.4
	4.	9	28.1	20	62.5			
J.	1.	9	28.1	5	15.6	DISAGREE	45	70.3
	2.	16	50.0	15	46.9			
	3.	6	18.8	9	28.1	AGREE	19	29.7
	4.	1	3.1	3	9.4			
K.	1.	8	25.0	9	28.1	DISAGREE	48	75.0
	2.	16	50.0	15	46.9			
	3.	7	21.9	6	18.8	AGREE	16	25.0
	4.	1	3.1	2	6.3			
L.	1.	1	3.1	0	0	DISAGREE	4	6.3
	2.	2	6.3	1	3.1			
	3.	10	31.3	12	37.5	AGREE	60	93.7
	4	19	59.4	19	59.4			

Figure 5, cont. Instructional methods and emphases.

STATEMENT	TYPE OF RESPONSE	STAFF PERSONNEL		INDEPENDENT PERSONNEL		RESPONSE SIMPLIFIED	COMBINED	
		NO.	%	NO.	%		NO.	%
M.	1.	1	3.1	3	9.4	DISAGREE	12	18.8
	2.	3	9.4	5	15.6			
	3.	20	62.5	18	56.3	AGREE	52	81.2
	4.	8	25.0	6	18.8			
S.	1.	1	3.1	0	0	DISAGREE	2	3.1
	2.	0	0	1	3.1			
	3.	10	31.2	8	25.0	AGREE	62	96.9
	4.	21	65.6	23	71.9			
T.	1.	5	15.6	10	31.2	DISAGREE	55	85.9
	2.	22	68.8	18	56.2			
	3.	3	9.4	2	6.2	AGREE	9	14.1
	4.	2	6.2	2	6.2			
U.	1.	1	3.1	2	6.2	DISAGREE	14	21.9
	2.	7	21.9	4	12.5			
	3.	19	59.4	19	59.4	AGREE	50	78.1
	4.	5	15.6	7	21.9			

importance of learning to detail using both the T-square and CAD. Of the pool of respondents segregated by the tool they personally used, 100% of the CAD users and 93% of the non-users agreed that students should learn to detail using a T-square; also, 77% of the users and 87% of the non-users agreed that students should learn to detail using CAD.

Regarding detailing assignments using CAD, 100% of the CAD users and 95% of the non-users indicated that students should not be allowed to execute all of their detailing assignments using CAD. However, 77% of the CAD users and 87% of the non-users agreed that students should be required to execute a minimum number of details using CAD.

Both CAD users (89%) and non-users (82%) disagreed that a furniture detail worked out at a scale which is less than full size is as effective as one which is full size.

This last point of concern speaks to a limitation inherent in the use of CAD for detailing furniture. While a user can see parts of the detail at full scale on the computer screen, currently available computer screens are unable to show the total detail at full scale. Technology may at some time in the future economically resolve this problem . Until resolved, the

Figure 6. Tool use.

STATEMENT	TYPE OF RESPONSE	CAD USERS					CAD NON-USERS					COMBINED		
				SIMPLIFIED					SIMPLIFIED			SIMPLIFIED		
		NO.	%		NO.	%				NO.	%		NO.	%
N.	1.	0	0	D.	1	11.1	2	3.6	D.	15	27.3	D.	16	25.0
	2.	1	11.1				13	23.6						
	3.	4	44.4	A.	8	88.9	31	56.4	A.	40	72.7	A.	48	75.0
	4.	4	44.4				9	16.4						
O.	1.	0	0	D.	0	0	2	3.6	D.	4	7.3	D.	4	6.3
	2.	0	0				2	3.6						
	3.	5	55.6	A.	9	100.0	28	50.9	A.	51	92.7	A.	60	93.7
	4.	4	44.4				23	41.8						
P.	1.	0	0	D.	2	22.2	0	0	D.	7	12.7	D.	9	14.1
	2.	2	22.2				7	12.7						
	3.	5	55.6	A.	7	77.8	40	72.7	A.	48	87.3	A.	55	85.9
	4.	2	22.2				8	14.6						
Q.	1.	5	55.6	D.	9	100.0	24	43.6	D.	52	94.5	D.	61	95.3
	2.	4	44.4				28	50.9						
	3.	0	0	A.	0	0	2	3.6	A.	3	5.5	A.	3	4.7
	4.	0	0				1	1.8						
R.	1.	3	33.3	D.	8	88.9	29	52.7	D.	45	81.8	D.	53	82.8
	2.	5	55.6				16	29.1						
	3.	1	11.1	A.	1	11.1	5	9.1	A.	10	18.2	A.	11	17.2
	4.	0	0				5	9.1						

T-square, parallel bar, or drafting machine will continue to be more useful to the designer for evaluating scale and proportion.

The results of this area of concern supported the caution with which the Furniture Design program is approaching the instruction in CAD as a tool for detailing. The profession, both CAD users and non-users, recognize that students should be taught to detail using this new tool. It remains the program's responsibility to determine at what point in the curriculum students would best benefit from exposure to CAD.

It should be noted that several (10) respondents, through comments included on the returned surveys, emphasized that it is important for detailing students to thoroughly master the T-square method for a number of reasons. They said that curves made by hand can more effectively capture beauty than by the use of CAD. Students, early on, need to train their brains, bodies, arms, hands, and fingers to create beautiful lines, surfaces, and volumes. The styles used in the home furnishings industry demand the use of complex and difficult curves which cannot easily be reduced to the quadradically generated curves required by the computer. It simply takes too much time. The CAD-using respondents indicated that an introduction to the use of CAD may be

all that is necessary for students since it is highly probable that their future employer may possess different hardware and software than that on which the student initially learned.

The statistics resulting from this section, combined with the individual comments seem to suggest that caution should be exercised in the implementation of CAD within the detailing sequence.

Content Areas and Achievement Standards

The statistical results regarding ability areas are found on Figure 7, which continues onto a second page. The results regarding knowledge areas are found on Figure 8, which also continues onto a second page.

The presentation in this text of the resulting data from the survey will consist of lists under both the ability and knowledge areas. Each outcome item will be listed under the level designated in the survey to which the profession expects the Furniture Design graduates to achieve. Behind each item will be the percentage of the combined respondents who chose that expectation level.

Ability Areas

Highly proficient to good ability expectations:

1. Communicate intellegently pertaining to the detail, 89%.

2. Detail a case, 70%.

3. Use a T-square, 66%.

4. Detail dining chairs, 59%.

5. Detail cabriole legs, 58%.

6. Detail to a set of standards, 55%.

7. Detail curve-back dining chairs, 45%.

8. Specify decorative materials, 39%.

Good to medium ability expectations.

1. Detail a non-wood product, 53%.

2. Develop patterns, 45%.

3. Detail upholstery, 42%.

4. Detail trim hardware, 42%.

5. Show glass elements, 41%.

Medium to threshold ability expectations.

1. Use CAD, 47%.

2. Source non-wood and purchased items, 47%.

In the ability area, items which the respondents added to the given list include the following: general verbal communication, to detail with balance and proportion, to use a drafting machine or parallel bar, to source decorative materials and parts, to run a blueprint machine, to upholster a chair, to build a case, to letter effectively, and to never stop learning.

Obviously, some of the added ability suggestions go beyond the sphere of detailing. These are items, however,

Figure 7. Ability area expectations.

ABILITY AREA	EXPECTED LEVEL	STAFF		INDEPENDENT		COMBINED	
		NO.	%	NO.	%	NO.	%
DETAIL A CASE	A.	25	78.1	20	62.5	45	70.3
	B.	7	21.9	10	31.2	17	26.6
	C.	0	0	2	6.2	2	3.1
DETAIL UPHOLSTERY	A.	13	40.6	6	18.8	19	29.7
	B.	11	34.4	16	50.0	27	42.2
	C.	8	25.0	10	31.2	18	28.1
DETAIL DINING CHAIRS	A.	21	65.6	17	53.1	38	59.3
	B.	7	21.9	9	28.1	16	25.0
	C.	4	12.5	6	18.8	10	15.6
DEVELOP PATTERNS	A.	7	21.9	4	12.5	11	17.2
	B.	14	45.2	15	46.9	29	45.3
	C.	11	34.4	13	40.6	24	37.5
SHOW GLASS ELEMENTS	A.	16	50.0	8	25.0	24	37.5
	B.	9	28.1	17	53.1	26	40.6
	C.	7	21.9	7	21.9	14	21.9
DETAIL TRIM HARDWARE	A.	9	28.1	1	3.1	10	15.6
	B.	11	34.4	16	50.0	27	42.2
	C.	12	37.5	15	46.9	27	42.2
SPECIFY DECORATIVE MATERIALS	A.	18	56.2	7	21.9	25	39.1
	B.	10	31.2	15	46.9	25	39.1
	C.	4	12.5	10	31.2	14	21.9
COMMUNICATE INTELLIGENTLY PERTAINING TO DETAIL	A.	29	90.6	28	87.5	57	89.1
	B.	3	9.3	3	9.3	6	9.4
	C.	0	0	1	3.1	1	6.1

Figure 7, cont. Ability area expectations.

ABILITY AREA	EXPECTED LEVEL	STAFF		INDEPENDENT		COMBINED	
		NO.	%	NO.	%	NO.	%
DETAIL NON-WOOD PRODUCT	A.	9	28.1	4	12.5	13	20.3
	B.	15	46.9	19	59.4	34	53.1
	C.	8	25.0	9	28.1	17	26.6
DETAIL CABRIOLE LEGS	A.	22	68.8	15	46.9	37	57.8
	B.	9	28.1	11	34.4	20	31.2
	C.	1	3.1	6	18.8	7	10.9
DETAIL CURVE-BACK DINING CHAIRS	A.	17	53.1	12	37.5	29	45.3
	B.	11	34.4	11	34.4	22	34.4
	C.	4	12.5	9	28.1	13	20.3
DETAIL TO A SET OF STANDARDS	A.	22	68.8	13	40.6	35	54.7
	B.	8	25.0	13	40.6	21	32.8
	C.	2	6.3	6	18.8	8	12.5
USE A T-SQUARE	A.	24	75.0	18	56.2	42	65.6
	B.	6	18.8	11	34.4	17	26.6
	C.	2	6.3	3	9.3	5	7.8
SOURCE NON-WOOD AND PURCHASED ITEMS	A.	9	28.1	3	9.3	12	18.8
	B.	10	31.2	13	40.6	23	35.9
	C.	13	40.6	16	50.0	26	40.6
USE CAD	A.	7	21.9	1	3.1	8	12.5
	B.	12	37.5	14	43.8	26	40.6
	C.	13	40.6	17	53.1	30	46.9

which may promote the ability to detail, and are worthy of consideration if not already included in the total Furniture Design curriculum. The respondents did not prioritize their added ability area suggestions.

Knowledge Areas

Highly proficient to good knowledge expectations.

1. Terminology pertaining to construction, 68%.
2. Terminology pertaining to style categories, 66%.
3. Stock size usage, 55%.

Good to medium knowledge expectations.

1. Functional hardware, 56%.
2. Woodworking, 56%.
3. Joinery, 55%.
4. Machinery capabilities and limitations, 52%.
5. Differing case construction, 47%.
6. Bed and headboard parameters, 45%.

None of the knowledge areas listed in the survey received the largest percentage of response for the medium to threshold expectation level.

In the knowledge area, items which the respondents added to the given list include the following: upholstery (methods and information), business ethics, carving, traditional chairs and cases, standardized case construction, metals, wicker, glass, rattan,

Figure 8. Knowledge area expectations.

KNOWLEDGE AREA		STAFF		INDEPENDENT		COMBINED	
		NO.	%	NO.	%	NO.	%
MACHINERY CAPABILITIES AND LIMITATIONS	A.	8	25.0	11	34.4	19	29.7
	B.	17	53.1	16	50.0	33	51.6
	C.	7	21.9	5	15.6	12	18.8
STOCK SIZE USAGE	A.	22	68.8	13	40.6	35	54.7
	B.	8	25.0	14	43.8	22	34.4
	C.	2	6.3	6	18.8	8	12.5
FUNCTIONAL HARDWARE	A.	15	45.9	3	9.4	18	28.1
	B.	15	45.9	21	65.6	36	56.2
	C.	2	6.3	8	25.0	10	15.6
BED AND HEADBOARD PARAMETERS	A.	14	43.8	8	25.0	22	34.4
	B.	15	45.9	14	43.8	29	45.3
	C.	6	9.4	9	28.1	12	18.8
TERMINOLOGY PERTAINING TO STYLE CATEGORIES	A.	25	78.1	17	53.1	42	65.6
	B.	7	21.9	11	34.4	18	28.1
	C.	0	0	4	12.5	4	6.3

Figure 8, cont. Knowledge area expectations.

KNOWLEDGE AREA	EXPECTED LEVEL	STAFF		INDEPENDENT		COMBINED	
		NO.	%	NO.	%	NO.	%
TERMINOLOGY PERTAINING TO CONSTRUCTION	A.	24	75.0	19	59.4	43	67.2
	B.	8	25.0	11	34.4	19	29.7
	C.	0	0	2	6.3	2	3.1
WOOD WORKING	A.	7	21.9	4	12.5	11	17.2
	B.	15	45.9	21	65.6	36	56.2
	C.	10	31.3	7	21.9	17	26.6
JOINERY	A.	12	37.5	8	25.0	20	31.3
	B.	17	53.1	18	56.3	35	54.7
	C.	3	9.4	6	18.8	9	14.1
DIFFERING CASE CONSTRUCTION	A.	10	31.3	8	25.0	18	28.1
	B.	13	40.6	17	53.1	30	46.9
	C.	7	21.9	7	21.9	14	21.9

aluminum, plastics, marketing, attitudes, acceptance of the real world, compromise, respect, adjusting to the needs of the manufacturer, veneers and solids and their cost factors.

As under ability areas, some of the added knowledge area suggestions go beyond the sphere of detailing. Again, these suggestions were not prioritized.

In general, the results from Part IV of the survey provided a validation of the ability and knowledge areas which are currently contained in the detailing sequence. The results also validated items which either do not currently exist, or are only nominally covered within the discipline. The expected levels of achievement which the profession indicated for these areas will become a useful standard with which to structure the ability and knowledge areas into the discipline. They also support an individualized model where students can work in depth in a few areas, and then learn about other areas from their peers' projects.

Conclusions and Recommendations

The large number of individual items with which this study is concerned compels the author to follow each conclusion with its respective recommendation. These recommendations will be directed to the appropriate level within the college institution, whether it be the

Detailing discipline, the Furniture Design program, or the college itself. This method will be applied first to the data derived from Part III of the survey, and then to the data from Part IV.

Methods and Emphases for Instruction

Detailing in the Curriculum

The members of the furniture design profession who responded to the survey questionnare indicated that Kendall's Furniture Design program most definitely should continue to teach detailing for the education of its students. Later conclusions may reveal whether the students should experience an even greater exposure to this discipline.

Content and its Derivation

Detailing should expose students to many forms and styles of furniture. The subject material used for this purpose should, as much as possible, be derived from student-generated designs. Also, the students should be equally exposed to these forms and styles.

The author recommends that the program coordinate the furniture design courses and their assignments so that students produce a body of designs which contain furniture forms and styles useful as subject material for the detailing courses. The author realizes that this is not the foremost goal of the design courses. However,

by careful assignment in these courses, the instructors could guarantee that useful forms and styles were produced by the students. For example, an assignment requiring students to design a Queen Anne dining group would generate aesthetic problems inherent to this and other styles related to this genre. This type of assignment would also generate joinery and construction problems inherent to the furniture forms found in dining furniture. Since the author does not presume to be able to determine the most encompassing forms, or styles which best illustrate these forms, he recommends that the Furniture Design instructors make these determinations as a group, and through serious study and discussion.

Industrial Construction Standards

The profession indicated that students should learn to detail according to more than one set of industrial standards. Also, they indicated that students should be allowed to solve detailing problems in a variety of ways.

The author recommends that the Detailing discipline use two sets of standards for this purpose. One standard should be based upon dowel joinery. The second should be based upon mortise-and-tenon joinery. Until an adaquate textbook is found for these, these standards should be defined through useful handouts generated and

agreed upon by the detailing instructors.

To avoid confusion on the part of the students, the program should teach these standards individually. The second set of standards should be introduced after the first is mastered by the students. Therefore, sufficient time would have to be allowed for this to be accomplished. After students achieve mastery in these standards, they should be allowed to choose the standard most appropriate to their individual assignments for the remaining time within the detailing sequence.

Since the profession agreed that a better designed object results from the balanced consideration of aesthetic aspects, structure, manufacturing capabilities, and cost constraints, the author encourages the detailing instructors to continue in this emphasis.

Effective Content on Details

The profession indicated that allowing accurate space for construction and parts is sufficient for a useful detail.

For this method to be effectively used, a student must first understand the construction and parts needed in a viable piece of commercial furniture. The author recommends that the discipline requires that students who are in the process of learning appropriate construction of furniture must show all construction and parts. After

students can demonstrate a thorough ability and knowledge in this area, they should be permitted to merely make accurate allowances for construction and parts on their detail.

Related Student Skills

The profession indicated that the students would benefit by constructing their own designs.

The author recommends that the current Furniture Construction course continue to be required in the curriculum, and that it should include as one of its goals the preparation of students for this activity.

The author further recommends that a higher level construction course continue to be offered as a studio elective to facilitate this activity.

Tools Used

The profession indicated that students should learn to detail using the T-square, learn to detail using CAD, and be required to execute a minimum number of details using CAD. They should not, however, be allowed to detail all of their assignments using CAD.

The author recommends to the program that instruction in CAD should occur within a detailing course. Students should be initially taught to detail using the T-square. This would occur during the Detailing I course and continue into the Detailing II

course. Further, the author recommends that the Detailing II course become a six credit-hour course. The second half of this course should be devoted to instruction in the use of CAD. The instructors should formulate a body of assignments which will enhance student progression of learning this tool. The program should encourage students to experiment with this tool to increase their facility in its use. The author recommends that the instructors of detailing learn to use this tool, and that the college provide ways and means for this to occur.

Content Areas and Achievement Expectations

The content areas which will be listed in this section of conclusions and recommendations include only those items which are absent or less than sufficiently covered in the current Furniture Design curriculum. The ability and knowledge areas will be considered separately. Each list found under these areas will be comprised of items grouped according to the achievement level which the profession expects to see in graduates of the Furniture Design program. Following each item in the lists will be found recommendations for that item.

Ability Area

Highly proficient to Good Mastery Expectations.

1. Communicate intellegently pertaining to the

detail. It is recommended that the instructors of the discipline compose a list of terms and concepts commonly used within the furniture industry, and require students to learn and use these, starting in the courses in which they are first introduced. This practice must continue throughout the curriculum where applicable.

2. Detail curve-back dining chairs. It is recommended to the discipline that this ability be introduced in the Detailing III course. Students should have the practice in this concept at least three times in their remaining detailing course work. It is recommended that the program consider the inclusion of a studio elective which specializes in hard-seating units.

3. Specify decorative material. It is recommended to the program that students be taught to recognize decorative materials starting in Ornaments, and continuing through the design sequence. Starting in Detailing I, Students should be taught to specify these materials. This should be reinforced throughout the remaining courses in the detailing sequence.

Good to Medium Mastery Expectations.

1. Detail non-wood products. It is recommended that the discipline introduce the detailing of these items starting in the Detailing III course, and repeat this

exercise with fresh material twice before graduation.

2. Detail upholstery. It is recommended that the program create a required studio elective which covers both the design and detailing of upholstery. This course should be offered once every two years so that all students could take it once during their time in the program.

3. Detail trim hardware. It is recommended to the program that it require students in the furniture design courses to design at least one piece of trim hardware in each course, and use this design to detail in the detailing courses. This detailing exercise should be done at least once in each detailing course, starting in Detailing II.

Medium to Threshold Mastery Expectations.

1. Use CAD. The recommendation for the use of this tool falls under Methods and Emphases for Instruction.

2. Source non-wood and purchased items. It is recommended to the discipline that students be required to source all non-wood and purchased items starting at the Detailing III level.

Ability Items Generated by the Respondents.

Since the profession did not indicate any mastery expectations for these items, they will be listed, but with the recommendation that the program determine their

appropriate mastery levels, and integrate these items into the Furniture Design curriculum and the detailing sequence. These items include:

1. Use of the parallel bar.

2. Ability to letter effectively.

Knowledge Area

It bears repeating that only those items insufficiently or not currently covered in the Furniture Design curriculum are listed for conclusion and recommendation.

Highly Proficient to Good Mastery Expectations.

1. Terminology pertaining to construction and style categories. These areas closely parallel the ability to intellegenty communicate with respect to the detail. The author refers to the recommendation for that area. It bears restating that although detailing is primarily concerned with graphic communication, the college and the Furniture Design program would be remiss not to emphasize the importance of effective verbal and written communication. The college is, after all, committed to educating the whole person.

Good to Medium Mastery Expectations.

1. Functional Hardware. It is recommended to the discipline that students be taught the terminology and application of functional hardware as it pertains to

their individual detailing problems. This should start in Detailing III and continue thereafter. Although all students may not necessarily encounter identical applications, students could easily learn through their peers' projects. The instructors should be aware of this, and call their students' attention to these different applications as they are encountered.

2. Machinery capabilities and limitations. It is recommended to the program that students be initially exposed to these features of machinery within the Furniture Construction course. This knowledge should be reinforced and expanded upon in the remaining detailing courses.

3. Bed and headboard parameters. It is recommended to the discipline that knowledge about this area be introduced in the Detailing II course, and reinforced for application in the Detailing IV course.

Knowledge Items Generated by the Profession.

Although the profession did not indicate mastery expectations for these items, recommendations will, nevertheless, be made concerning these because they are currently insufficiently covered by the program, and are regarded as significant to professional design practice by both the survey respondents and the faculty.

1. Upholstery (methods and information). Recommendations regarding upholstery were made under the

Ability area.

2. Various materials, including metals, wicker and rattan, aluminum, and plastics. It is recommended to the Furniture Design program and to the college that a design seminar be constructed, and established as a requirement for Furniture Design students. This course should introduce to the students the nature and uses of various materials including fabrics, and should also consider interior design principles, human factors, needs analysis for product function, and other background information areas currently encumbering the design and detailing courses. If this type of information could be gained through other majors' course offerings, then the author recommends that the Furniture Design program incorporate that course into its own curriculum.

The Content, Structure, and Sequence of Furniture Detailing

Perhaps the most effective method to describe how the foregoing recommendations could be structured into the current Furniture Design curriculum is through the use of a graphic matrix. Figure 9 contains such a matrix to describe the introduction, re-introduction, reinforcement, and outcome expectations of subject areas in the Detailing discipline. These are

cross-referenced with the current Furniture Design curriculum.

By way of example, the T-square as a tool is first introduced through Technical Drafting. It is reinforced in Detailing I, II, and III. The professional outcome expectation for the use of a T-square is proficient to good. The Key of the matrix indicates that this expectation is symbolized by the letter A, the same symbol used in the survey instrument. The letter A can be seen on the matrix as the outcome expectation for T-square use in the Detailing IV course.

T-square is found in the vertical column along the left edge of the matrix. It is the 14th item from the bottom of the column.

The horizontal column along the top edge of the matrix contains a complete list of the required courses in the Furniture Design curriculum. It begins at the left end of the column and proceeds to the right in the chronological order in which the program suggests that students should subscribe to the courses.

In our example, T-square is represented by a dot under Technical Drafting because this is the course of its introduction. It is represented by a diagonal line under Detailing I, II, and III because these courses reinforce its use. The letter A appears under

Detailing IV because the outcome level which the profession seeks in students at the conclusion of this course is highly proficient to good.

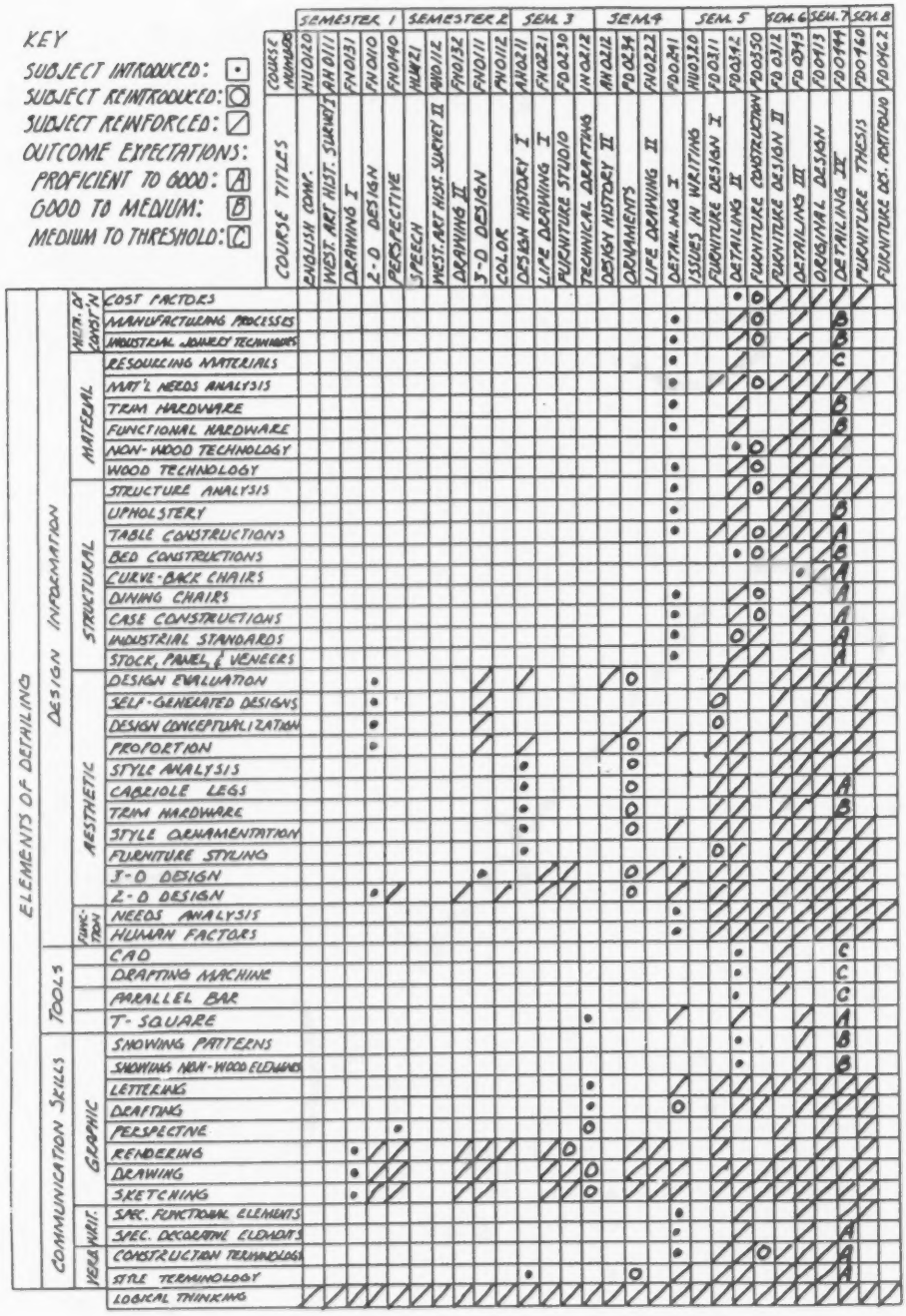
All of the ability and knowledge items derived through the survey are similarly rated at the Detailing IV course. Methods and emphases for instruction, while included on the matrix, are non rated by expectation levels. Also included on the matrix, but not rated, are ability and knowledge areas which are foundational to the skills needed to detail.

Some items are listed in the vertical column twice because they fall under different elements of detailing. An example of this is trim hardware. It is listed as both material and aesthetic design information.

Some listed items encompass more than one item derived from the survey. An example of this is found in specification of decorative elements, fourth from the bottom of the column. This term includes items such as glass, veneers, brass, etc.

As noted earlier, this matrix is based upon the current Furniture Design curriculum. Some of the recommendations indicate the inclusion of currently non-existing courses. If they, at some point in time, were to be included in the curriculum, the structure of the matrix would have to be changed. It is the author's

Figure 9. Detailing matrix.



wish that the need for a new matrix will occur sooner than later.

Conclusion

It is hoped that the instructional staff of the Furniture Design program at Kendall will be encouraged to analyze this document, and discuss its proposed changes to the Detailing discipline, the Furniture Design program, and the college.

A rigorous task yet to be undertaken concerns the determination of specific instructional goals and objectives. These must consider the individual learning levels and abilities of the students. It is hoped that the contents of this document will give direction to those instructors and facilitate this task.

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Appendix A

Course Descriptions

COURSE DESCRIPTION

COURSE NUMBER: IN 0212

CREDIT HOURS: 3

COURSE TITLE: Technical Drafting

CONTACT HOURS PER WEEK: 6

PREREQUISITES:

TYPE OF COURSE:
LECTURE
STUDIO XX

COURSE DESCRIPTION:

Enables students to use drafting instruments for geometric construction, introduces principles of orthographic projection, pictorial drawings, auxiliary and sectional views, threads and fasteners (convention and coordinate), dimensioning, detail and assembly drawings. The ability to present three-dimensional concepts on a two-dimensional surface will be emphasized.

GOALS OF THE COURSE:

1. To familiarize students with the application and use of drafting instruments;
2. To introduce the techniques of drafting as it relates to finished drawings;
3. To learn to draft in one, two, and three point perspective.

COURSE OF STUDY:

TEXT: None.
Date approved:
Date for review:

BIBLIOGRAPHY AND SUPPLEMENTARY RESOURCES:

10/31/89 DATE PASSED CURRICULUM COMMITTEE
REVISED:

COURSE DESCRIPTIONS

FURNITURE DESIGN

FD 0000 FURNITURE DESIGN PORTFOLIO REVIEW **0 Credits**

A requirement for all students who wish to seek acceptance into their intended major. Students will submit examples of studio work to a faculty committee for evaluation and consideration, normally during the first semester of the sophomore year.
Prerequisites: Nearing completion of 21-24 studio credits

FD 0230 FURNITURE STUDIO **3 Credits**

Gives students exposure to and experience with the fundamental tools and techniques of furniture product representation. Scale and measured drawing, freehand sketching, and product rendering will be introduced, with practical experiences used to reinforce skill development. Both technical rendering and aesthetic concerns will be emphasized with regard to product representation.
Prerequisites: FN 0112, FN 0132

FD 0234 ORNAMENTS **3 Credits**

Analysis and study of historical furniture ornamentation, including: veneers and benchwork, profile turnings, profile moldings, carving and embossing, and decorative hardware. The utilization of these elements and the recognition of typical style applications are stressed. Materials and manufacture of these elements are studied, researched, and detailed. Emphasis is placed on the proper representation of ornaments in a variety of rendering media.
Prerequisites: IN 0212,

FD 0241 DETAILING I **3 Credits**

Studies furniture construction methods using standard three-view working drawings. Emphasizes the development of understanding of drafting techniques which includes full-sized detail layout, notation and lettering, part and product dimensioning. In addition, emphasis is placed on typical construction standards and joinery.
Prerequisites: IN 0212

FD 0311 FURNITURE DESIGN I **3 Credits**

Studies and practices design of furniture product - through researching proportion, scale, and typical style elements. Students will prepare furniture designs for residential products including tables, casegoods, and seating. Development of product presentation abilities is required.
Prerequisites: FN 0112, FN 0132, FN 0222, AH 0212, IN 0212

FD 0312 FURNITURE DESIGN II **3 Credits**

Studies furniture product design with an emphasis on the development of product groups and collections. Effective product presentation will be stressed. Extensive research into styling, element utilization, and product adaptation is required.
Prerequisites: FD 0311

FD 0342 DETAILING II **3 Credits**

Introduces practical problem-solving methods for furniture design and construction using the furniture detail as a vehicle. The details are drawn from assigned archetypes and from students' own product design work.
Prerequisites: FD 0241

FD 0343 DETAILING III **3 Credits**

As an advanced course in detailing, more demanding designs are detailed approaching the professional level. Students apply industrial standards to working drawings, with focus on material utilization, production methods, and product development.
Prerequisites: FD 0342, FD 0350

FD 0350 FURNITURE CONSTRUCTION **3 Credits**

Gives a practical experience in working with a variety of common industrial woodworking machines. Brings the design student into the shop to demonstrate the flexibility and/or limitations of production equipment as it relates to product design and production.
Prerequisites: FD 0241

FD 0413 ORIGINAL DESIGN **3 Credits**

Studies design of original furniture products within defined parameters. The effective use of various materials, functional considerations, and production methods will be emphasized. Students will demonstrate product development through both 2-D and 3-D techniques as assigned. Product presentation, both verbal and visual, will approach professional standards.
Prerequisites: FD 0312

FD 0444 DETAILING IV **3 Credits**

As the most advanced detailing course, treats the students' work as approaching the professional level. Students must be able to define and defend full-sized details as to commercial demands, line comprehension, continuity of view, and applicability to specific manufacturing methods. Knowledge of materials, hardware, and suitability to manufacture are expected to be understood.
Prerequisites: FD 0343

FD 0460 FURNITURE DESIGN THESIS **3 Credits**

As the senior design and development project, relates to every aspect of the Furniture Design major. The design project is determined in conference with the faculty advisor prior to enrollment in this course. The student is expected to define the design problem and bring the solution to a state of completion through sketches, detail drawings, and models/prototype (optional). The student is expected to utilize all the skills learned in the Furniture Design program. An oral mid-term and final presentation is required.
Prerequisites: FD 0343, FD 0413

FD 0462 FURNITURE DESIGN PORTFOLIO **3 Credits**

Emphasizes the quality and scope of the students' design portfolio and the effective presentation of the skills and talents represented therein. Focus will be placed on scope and quality of product presentation including effective oral, visual (2-D and 3-D as appropriate), and written communication.
Prerequisites: FD 0413

Appendix B

Suggested Plan of Study

NAME: _____ START TERM: _____ TODAY'S DATE: _____

FURNITURE DESIGN
Suggested Plan of Study

FRESHMAN YEAR

Fall Semester			Winter Semester		
☐ HU 0120	English Composition	3	☐ HU 0121	Fund. of Speech	3
☐ AH 0111	West. Art Hst. Survey I	3	☐ AH 0112	West. Art Survey II *PREQ. AH 0111*	3
☐ FN 0131	Drawing I *COREQ. FN 0140*	3	☐ FN 0132	Drawing II *PREQ.FN 0131,0140*	3
☐ FN 0110	2-D Design	3	☐ FN 0111	3-D Design *PREQ. FN 0110*	3
☐ FN 0140	Perspective *COREQ. FN 0131*	3	☐ FN 0112	Color *PREQ. FN 0110* *COREQ. FN0131,0140*	3
TOTAL SEMESTER CREDITS		15cr.	TOTAL SEMESTER CREDITS		15cr.

SOPHOMORE YEAR

Fall Semester			Winter Semester		
☐ LAS ELECTIVE		3	☐ AH 0212	Design History II *PREQ.AH0211 1D/only*	3
☐ AH 0211	Design History I *PREQ. AH 0111,0112*	3	☐ FD 0234	Ornaments *PREQ.IN 0212,FN 0132*	3
☐ FN 0221	Life Drawing I *PREQ.FN 0112,0132*	3	☐ FN 0222	Life Drawing II *PREQ. FN 0221, 0111, Portfolio Review*	3
☐ FD 0230	Furniture Studio *PREQ. FN 0112,0132*	3	☐ FD 0241	Detailing I *PREQ. IN 0212*	3
☐ IN 0212	Tech Drafting	3			
☐ FD 0000	Portfolio Review	0	☐ STUDIO ELECTIVE		3
TOTAL SEMESTER CREDITS		15cr.	TOTAL SEMESTER CREDITS		15cr.

JUNIOR YEAR

Fall Semester			Winter Semester		
☐ LAS ELECTIVE		3	☐ LAS ELECTIVE		3
☐ HU 0320	Issues in Writing *PREQ. HU 0120*	3	☐ LAS ELECTIVE		3
☐ FD 0311	Furniture Design I *PREQ.FN 0222,IN 0212, AH 0212*	3	☐ FD 0312	Furn. Design II *PREQ. FD 0311*	3
☐ FD 0342	Detailing II *PREQ. FD 0241*	3	☐ FD 0343	Detailing III *PREQ. FD 0342, 0350*	3
☐ FD 0350	Furniture Construction *PREQ. FD 0241*	3	☐ STUDIO ELECTIVE		3
TOTAL SEMESTER CREDITS		15cr.	TOTAL SEMESTER CREDITS		15cr.

SENIOR YEAR

Fall Semester			Winter Semester		
☐ LAS ELECTIVE		3	☐ LAS ELECTIVE		3
☐ FD 0413	Original Design *PREQ. FD 0312*	3	☐ LAS ELECTIVE		3
☐ FD 0444	Detailing IV *PREQ: FD 0343*	3	☐ FD 0460	Furniture Thesis *PREQ. FD 0343,0413*	3
☐ STUDIO ELECTIVE		3	☐ FD 0462	Furn. Design Port. *PREQ. FD 0413*	3
☐ STUDIO ELECTIVE		3	☐ STUDIO ELECTIVE		3
TOTAL SEMESTER CREDITS		15cr.	TOTAL SEMESTER CREDITS		15cr.

GRADUATION REQUIREMENTS

Foundation = 24cr. "FN"

Art History = 12cr. "AH"

LAS = 30cr. BU, HU, NS, SS & (9 Electives) ENG, SPCH, ISSUES.

MAJOR = 39cr.

Studio Electives = 15cr

TOTAL = 120cr. 2.00 GPA

PORTFOLIO REVIEW *(major)*

To be done after the completion of 18 Foundation Studio Credits.

PORTFOLIO REVIEW *(transfer)*

All transfer studio courses are subject to a portfolio review by faculty.

CREDIT EVALUATION

Transfer credits accepted:
School

AH _____
LAS _____
FN _____
MAJOR _____
STD. ELEC. _____
TOTAL Transfer: _____

HOURS NEEDED FOR GRADUATION:

AH _____
LAS _____
FN _____
STD. ELEC. _____
MAJOR _____
*Elective to reach 120: ___
TOTAL Needed: _____

* These are extra credits needed to reach the 120 cr. for graduation. They would not be reflected on this plan.

HU 0320 Issues in Writing - is NOT required for those students who entered Kendall College prior to Fall'89. Returning students who re-entered Kendall in the Fall of 1989.must take HU 0320. 5/25/91

Official Signature: _____ Date: _____

Appendix C

Survey Instrument

February, 1992

Dear Designer,

The purpose of this mailing is to elicit your response in the form of a questionnaire regarding the discipline of Furniture Detailing. It is our hope that you are willing to contribute from your knowledge, experience and time toward this effort. It is our goal to benefit the Furniture Design students through this.

If you have no desire to participate in this effort, please use the enclosed, stamped envelope to return the questionnaire material.

The information received through this questionnaire will be analyzed in order to make appropriate adjustments in the content, structure and sequence of the Furniture Detailing courses within the context of the entire curriculum. In so doing, it is our goal to better educate our students toward their maximum potential.

Your thoughtful reflection in this matter and prompt return of the completed questionnaire are both coveted.

Thank you for your participation.

Sincerely,

Bruce E. Mulder

Bruce E. Mulder
Coordinator, Furniture Design

Kendall College of Art & Design
... North Division Avenue Grand Rapids MI 49503-3194 616 451 2787

BACKGROUND INFORMATION: Furniture Detailing at Kendall currently is taught as a sequence of four 3 credit-hour courses, each of which lasts for one 15 week semester. This sequence is preceded by a 3 credit-hour Technical Drafting course. Each 3 credit-hour course represents 90 clock hours of classroom studio experience. Upon graduation, each student will have been exposed to 450 clock hours of the drafting discipline. 360 of those hours represent Furniture Detailing. Students may exercise the option to complete up to 9 credit-hours of detailing at a cooperative or internship position. This is determined by student ability and job availability.

PART I: Participant Profile

A. Please check the appropriate area(s) which best describes your professional position/job function.

___Staff Designer ___Independent Designer
___Staff Detailer ___Independent Detailer
___Other, specify:_____

B. What is the source of your detailing ability?

___Formal education ___Combination of above
___Apprenticeship ___Other, specify:_____

C. If you detail, do you use CAD to detail?_____

D. If you use CAD, which hardware?_____
software?_____

E. Does your computer set-up serve your detailing needs effectively?_____ Why or why not?

F. What percentage of your professional studio work is spent in the doing or overseeing of detailing?
___0%-25% ___50%-75%
___25%-50% ___75%-100%

G. Which areas best describe the emphasis of your profession?

___contract design ___traditional ___occasional
___residential design ___casegoods ___office
___contemporary ___upholstery ___other, specify:_____

PART II: In this part please CHECK those knowledge/ability areas which you feel to be pre-requisite to the learning of detailing.

___Basic drafting skills ___Industrial joinery techniques
___Factory routing ___Manufacturing processes
___Machinery capabilities ___Furniture styling
___Style ornamentation ___Cost factors
___Artistic skills ___3-D visualization
___Logical thinking ___Knowledge of material properties
___:_____ ___:_____
___:_____ ___:_____

PART III: In this part, please circle the number under each statement which best indicates your degree of agreement or disagreement with that statement.
Number "1" indicates strong disagreement
Number "2" indicates disagreement
Number "3" indicates agreement
Number "4" indicates strong agreement

A. The curriculum for a Furniture Design major should include Furniture Detailing. 1 2 3 4
B. Furniture Detailing should expose a student to as many forms of furniture as possible (eg: chair, case, table, upholstery, etc.). 1 2 3 4
C. Furniture Detailing should expose a student to as many styling areas as possible, (eg: American, French, Oriental, etc.). 1 2 3 4
D. The detailing student should be assigned detailing projects derived from their own design work. 1 2 3 4
E. All detailing students should be exposed to the same type of detailing assignments. 1 2 3 4
F. All detailing students should work on identical assignments. 1 2 3 4
G. Detailing students would benefit most by detailing according to only one set of industrial standards throughout the detailing sequence 1 2 3 4
H. Students would benefit most by detailing from more than one set of industrial standards introduced periodically during the detailing sequence. 1 2 3 4
I. The detailing student should be allowed to solve construction problems in a variety of ways. 1 2 3 4
J. The detailing student should be concerned with styling characteristics rather than structural aspects. 1 2 3 4
K. Concern for the structure of the detailed object inhibits the aesthetic goal. 1 2 3 4
L. Detailing within the parameters of aesthetic goals, structure, manufacturing capabilities, cost constraints will lead to a better designed object. 1 2 3 4
M. The student's detailing ability would be improved by actually constructing furniture. 1 2 3 4
N. The student should learn to detail using CAD. 1 2 3 4
O. The student should learn to detail using the T-square. 1 2 3 4
P. The student should be required to execute a minimum number of details using CAD. 1 2 3 4
Q. The student should be allowed to execute all detailing assignments using CAD. 1 2 3 4
R. A furniture detail worked out in a scale which is less than full size is as effective as one which is full size. 1 2 3 4

PART III continued on side IV.

PART III, continued

S. A furniture detail is an effective means of communication between the designer and the manufacturer of the product.
1 2 3 4

T. A detail made by a designer is useful only if it contains all construction and parts.
1 2 3 4

U. An effective detailer must make accurate allowances for all construction and parts.
/ 2 3 4

PART IV: The purpose of this part is to help determine professional expectations for student outcomes in furniture detailing. In front of each statement indicate with the letter "A", "B", or "C" the level of that knowledge or ability you would expect to see in a recent graduate.
"A" represents: highly proficient to good
"B" represents: good to medium
"C" represents: medium to threshold

Ability to:

___detail a case
___detail upholstery
___detail dining chairs
___develop patterns
___show glass elements
___detail trim hardware
___specify decorative material
___communicate intelligently pertaining to the detail
___detail a non-wood product
___detail cabriole legs
___detail curved-back dining chairs
___detail to a set of standards
___use a T-square
___source non-wood and purchased items
___use CAD
___:_____
___:_____

Knowledge of:

___machinery capabilities and limitations
___stock size usage
___functional hardware
___bed and headboard parameters
___terminology pertaining to style catagories
___terminology pertaining to construction
___woodworking
___joinery
___differing case construction
___:_____
___:_____
___:_____
___:_____
___:_____
___:_____
___:_____
___:_____

PART V: Any comments you may wish to add regarding Furniture Detailing, or any part of the Furniture Design major are welcome.